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# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
# BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of **Bechtel et al**
Serial No.: **09/806,560**
Filed: **30-Mar-2002**
Title: **PLASMA DISPLAY SCREEN HAVING A REFLECTION LAYER**

Atty. Docket No.: **PHD 99-103**
Group Art Unit: **2875**
Examiner: **Dong, Dalei**

## APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

This is an appeal from the decision of the Examiner dated 27 January 2003, finally rejecting claims 1-4 of the subject application.

## I. REAL PARTY IN INTEREST

The above-identified application is assigned, in its entirety, to Koninklijke Philips Electronics, N.V., The Netherlands.

## II. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any co-pending appeal or interference which will directly affect or be directly affected by or have any bearing on the Board's decision in the pending appeal.



## III. STATUS OF CLAIMS

Claims 1-4 are pending in the application. Claim 1 stands rejected by the Examiner under 35 U.S.C. 102(b), and claims 2-4 stand rejected by the Examiner under 35 U.S.C. 103(a).

## IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to the final rejection in the Office Action dated 27 January 2003.

## V. SUMMARY OF THE INVENTION

The invention comprises a plasma display screen with a reflection layer that is configured to reflect both visible and ultraviolet (UV) light.

In a plasma display, a discharge gas is ignited to form a plasma (9) that emits UV radiation 120. The UV radiation 120 excites a phosphor 10, which subsequently releases visible light 14. (Applicants' page 3, line 30 through page 4, line 1.)

By providing a reflection layer 8 that reflects UV radiation, the UV radiation that does not initially excite the phosphor 10 is reflected back to the phosphor 10, thereby releasing additional light.

The Applicants teach a variety of material grain sizes and thicknesses to achieve a high UV reflection factor, depending upon the characteristics of the discharge gas (Applicants' tables 1 and 2). Dry or wet coating techniques can be used to efficiently create the reflection layer (Applicants' page 5, lines 8-17).

## VI. ISSUES

Are claims 1-4 patentable under 35 U.S.C. 102(b) and 103(a) over Wada (USP 4,692,662)?

## VII. GROUPING OF CLAIMS

Claims 1-4 stand or fall together.

## VIII. ARGUMENT

Claim 1 stands rejected under 35 U.S.C. 102(b) over Wada.

Claim 2 stands rejected under 35 U.S.C. 103(a) over Wada and Nagakubo (USP 5,541,479).

Claim 3 stands rejected under 35 U.S.C. 103(a) over Wada and Hellwig (USP 4,224,553).

Claim 4 stands rejected under 35 U.S.C. 103(a) over Wada and Ohsawa (USP 5,939,826).

In each of these rejections, the Examiner relies on Wada for teaching a reflective layer that reflects UV radiation. The Applicants respectfully traverse this interpretation of Wada.

In Applicants' claim 1, upon which each of the other rejected claims depend, the Applicants specifically recite a reflection layer having a refractive index for a wavelength between 147nm to 700nm (UV through visible light) of $n=n_{real}+ik$, where $n>1.3$ and $k<0.05$. The Examiner asserts that Wada's reflection layer has these characteristics, but fails to provide a basis for this assertion, other than the fact that Wada's reflection layer contains the same material as the Applicants' reflection layer, specifically $SiO_2$ and $Al_2O_3$ (Final Office action, page 5, last paragraph, continuing onto page 6).

As is known in the art, the refractive index of a material is dependent upon how the material is processed and applied. For example, the refractive index of silicon dioxide, $SiO_2$, differs substantially depending upon whether the silicon dioxide is in the form of granules of sand or in the form of a pane of glass. Even in the form of glass, the particular processing of the silicon dioxide affects the reflective and refractive indexes of the resultant form.

Wada teaches a refractive index of $n>1.3$, but does not address the claimed complex component ik. As is known in the art, the complex component defines the absorption properties of the material. Wada teaches a reflective layer having material that is deposited in power form and fired to form a compact glassy layer. Wada's materials are specifically chosen to provide a low melting point, and generally contain a large fraction of lead oxide. The Applicants respectfully submit that Wada's example formations of the reflection layer will substantially absorb light in the UV range (wavelengths below

400nm), and will exhibit an index of refraction with a complex component k that is orders of magnitude above the Applicants' claimed limit of $k<0.05$.

Also in claim 1, the Applicants specifically claim a reflective layer comprised of a non-metallic powder, wherein the grain size of the powder is between 100nm and 1000nm. In each of Wada's example formulations of the white reflective material, Wada specifically teaches a grain size between 3000 and 5000nm (Wada, column 7, lines 12-65).

## CONCLUSIONS

Because Wada does not teach or suggest a reflective layer with a refractive index complex component ik with $k<0.05$, and because Wada does not teach a reflective layer with a powder grain size between 100nm and 1000nm, both of which are specifically claimed in claim 1, upon which claims 2-4 depend, the Applicants respectfully request that the Examiner's rejection of claims 1-4 under 35 U.S.C. 102(b) and 103(a) be reversed by the Board, and the claims be allowed to pass to issue.

Respectfully submitted,

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APPENDIX
CLAIMS ON APPEAL

1. A plasma display screen comprising

a carrier plate,

a transparent front plate,

a rib structure which divides the space between the carrier plate and the front plate into plasma cells, which are filled with a gas, and

comprising one or more electrode arrays on the front plate or on the front plate and the carrier plate to generate corona discharges in the plasma cells, and

comprising a phosphor layer and a reflection layer,

characterized in that

the reflection layer contains a non-metallic powder having a refractive index for the wavelength range from 147 nm to 700 nm of $n = n_{real}+ik$, where $n > 1.3$ and $k < 0.05$,

said powder having an average grain diameter of $100\ nm < d < 1000\ nm$.

2. A plasma display screen as claimed in claim 1, characterized in that

the reflection layer has a layer thickness $s > 1\ \mu m$.

3. A plasma display screen as claimed in claim 1, characterized in that

the gas comprises xenon and that the non-metallic powder is selected from the group formed by $MgF_2$, $MgO$, $SiO_2$ and $Al_2O_3$.

4. A plasma display screen as claimed in claim 1, characterized in that

the reflection layer is a multilayer.